IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled)

2. (Currently amended) The microscope according to claim 24, wherein ~~characterised in that~~ the probe is metallic and the parameter indicative of the interaction is capacitance of an interface between probe and sample.

3. (Cancelled)

4. (Currently amended) The microscope according to claim 2, wherein ~~characterised in that~~ a second parameter indicative of the interaction, and the one on which the feedback mechanism ~~(26)~~ operates, is oscillation amplitude.

5. (Currently amended) The microscope according to claim 2, wherein ~~characterised in that~~ the probe detection mechanism ~~(24, 56, 58)~~ comprises a modulation signal generator ~~(48)~~ arranged to apply a modulating voltage across the interface between probe ~~(20, 54)~~ and sample ~~(12)~~ in order to modulate its characteristics and thereby to affect its electrical capacitance, a resonator ~~(42)~~ arranged to set up a resonating electric field in a circuit incorporating the probe ~~(20,~~

~~54)~~ and sample ~~(12)~~ and a detector ~~(46)~~ arranged to measure the electric field resonant frequency and thereby to enable variations in the capacitance of the interface to be measured as the modulating voltage is applied.

6. (Currently amended) The microscope according to claim 24, wherein ~~characterised in that~~ the probe ~~(20)~~ is adapted to interact with a magnetic field and the probe detection mechanism ~~(24, 56, 58)~~ is arranged to measure a parameter indicative of the magnetic interaction between the probe ~~(20, 52)~~ and the sample ~~(12)~~.

7. (Currently amended) The microscope according to claim 24, wherein ~~characterised in that~~ the probe ~~(20)~~ comprises a cantilever and actuator arranged to drive the cantilever in a "tapping" mode.

8. (Currently amended) The microscope according to claim 7, wherein ~~characterised in that~~ the parameter indicative of the strength of the interaction is bending of the cantilever as it taps the sample ~~(12)~~.

9. (Currently amended) The microscope according to claim 24, wherein ~~characterised in that~~ the probe ~~(54)~~ is an AFM cantilever and the one of the at least one parameter indicative of the strength of the interaction that is measured by the

probe detection mechanism ~~(24, 56, 58)~~ and used by the feedback mechanism ~~(26)~~ is bending of the probe ~~(54)~~.

10. (Currently amended) The microscope according to claim 9, wherein ~~characterised in that~~ the probe detection mechanism ~~(24, 56, 58)~~ comprises an interaction detection mechanism ~~(56)~~ arranged to measure at least one parameter indicative of the strength of the interaction between the probe ~~(54)~~ and the sample ~~(12)~~ and a deflection detection mechanism ~~(58)~~, the deflection detection mechanism being linked to the feedback mechanism ~~(26)~~ and arranged to measure bending of the probe ~~(54)~~.

11. (Currently amended) The microscope according to claim 9, wherein ~~characterised in that~~ the probe ~~(54)~~ comprises an actuator arranged to drive the cantilever in "tapping" mode.

12. (Currently amended) The microscope according to claim 24, wherein ~~characterised in that~~ the driving means ~~(22)~~ is arranged to oscillate the probe ~~(20)~~.

13. (Currently amended) The microscope according to claim 12, wherein ~~characterised in that~~ the driving means ~~(22)~~ includes a tuning fork.

14. (Currently amended) The microscope according to claim 24, wherein ~~characterised in that~~ the means for oscillating ~~(22, 52)~~ either the probe or the sample is arranged to oscillate the sample ~~(12)~~.

15. (Currently amended) The microscope according to claim 14, wherein ~~characterised in that~~ the means for oscillating the sample is a tuning fork ~~(52)~~ and the sample ~~(12)~~ is attached thereto.

16. (Currently amended) The microscope according to claim 24, wherein ~~characterised in that~~ the feedback mechanism ~~(26)~~ operates with a time constant which is greater than one cycle of probe oscillation and significantly less than total time taken to perform a scan.

17. (Currently amended) The microscope according to claim 12, wherein ~~characterised in that~~ the probe is oriented substantially vertically and the driving means ~~(16, 22)~~ is arranged to provide a relative linear translation of probe ~~(20)~~ and sample ~~(12)~~ in a direction substantially orthogonal to a probe oscillation plane, thereby defining a substantially rectangular scan area, the probe oscillation plane being defined by the orientation of the probe and an oscillation direction which is orthogonal to the orientation of the probe.

18. (Currently amended) The microscope according to claim 12, wherein ~~characterised in that~~ the probe is oriented substantially horizontally and the driving means ~~(16, 22)~~ is arranged to provide a relative linear translation of probe ~~(20)~~ and sample ~~(12)~~ in a direction substantially parallel to a probe oscillation plane, thereby defining a substantially rectangular scan area, the probe oscillation plane being defined by the orientation of the probe and an oscillation direction which is orthogonal to the orientation of the probe.

19. (Currently amended) The microscope according to claim 12, wherein ~~characterised in that~~ the probe is oriented substantially vertically and the driving means ~~(16, 22)~~ is arranged to provide a relative rotation of probe ~~(20)~~ and sample ~~(12)~~ about an axis substantially coincident with that about which the probe ~~(20)~~ is oscillated, thereby covering the scan area by a circular arrangement of scan lines.

20-23. (Cancelled)

24. (Previously presented) A scanning probe microscope for imaging a sample in accordance with an interaction between the sample and a probe, the microscope comprising

a first driving means arranged to provide relative motion between the probe and the sample surface and capable of bringing the sample and probe into close proximity, sufficient for a detectable interaction to be established between them;

a probe detection mechanism arranged to measure at least one parameter indicative of the strength of the interaction between the probe and the sample;

a feedback mechanism arranged to provide for adjustment of probe-sample separation via operation of the driving means in response to a variation in an average value of one of the at least one parameters away from a predetermined set value; and

a second driving means that causes resonant or near resonant lateral oscillation of either the sample or the probe, with an oscillation amplitude of at least one micrometer;

the microscope is arranged, in operation, to carry out a scan of the sample surface and a scan area is covered by an arrangement of scan lines, each scan line being provided by the lateral oscillation of either the probe or the sample such that oscillation amplitude directly determines maximum scan line length and the arrangement of scan lines is provided by operation of the first driving means, and readings are continually made by the probe detection mechanism to form an image corresponding to at least two variations of the measured parameter during each oscillation.

25. (Cancelled)

26. (Currently amended) The scanning probe microscope of claim 24, wherein the probe is an AFM cantilever and one of the at least one parameter indicative of the strength of the interaction is bending of the cantilever.

27-30. (Cancelled)